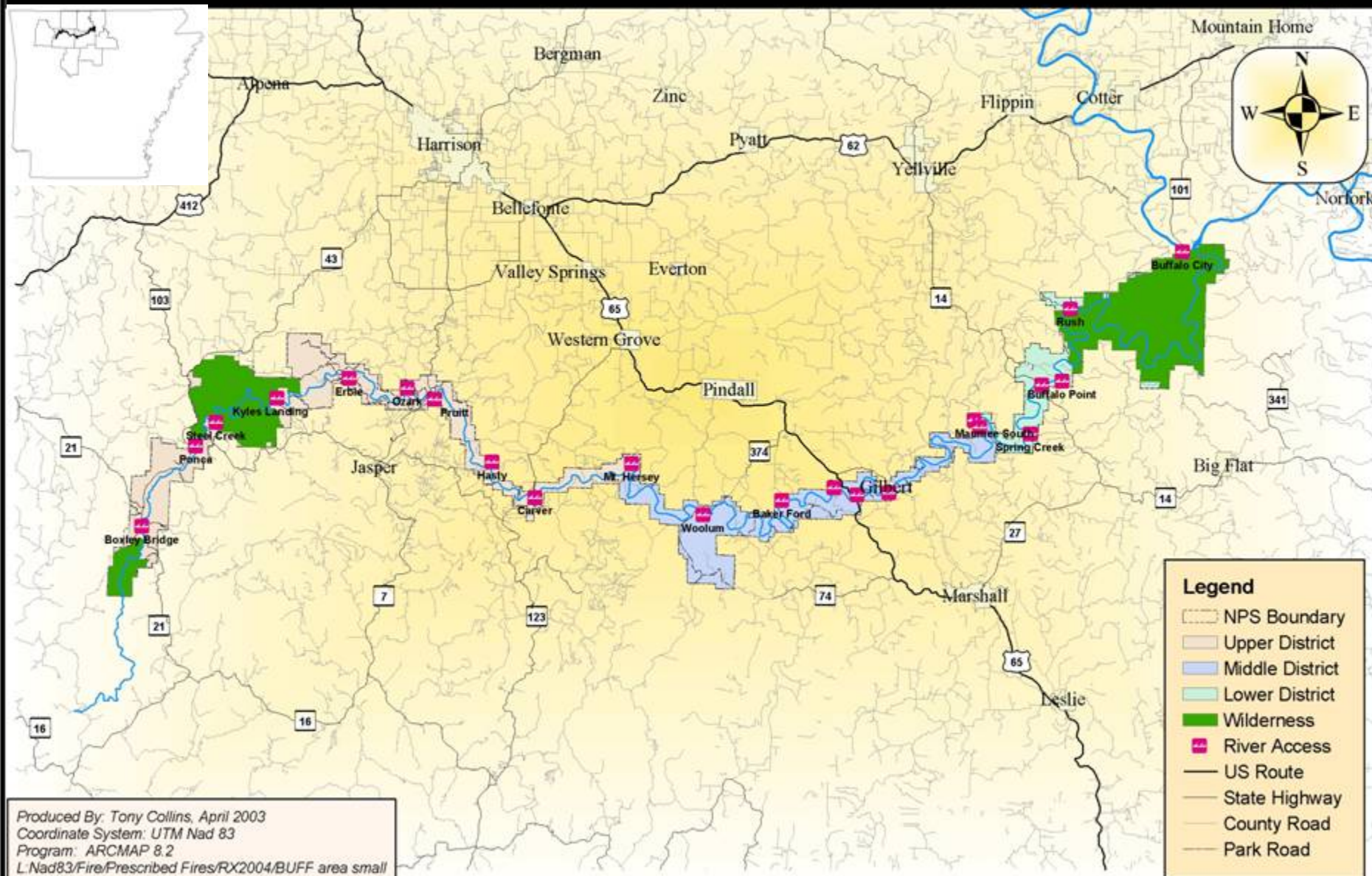




Assessment and Habitat Evaluation of Native Freshwater Mussel Resources of Buffalo National River

Shawn Hodges and Faron Usrey
Buffalo National River





Buffalo National River Facts

- Established in 1972 as America's first "National River"
- 153 miles long, upper 20 miles are Wild & Scenic under USFS.
- Park includes the remaining 133 miles and over 94,000 acres.
- Over 1 million visitors last year



Freshwater Mussels



Photos provided by the U.S. Fish and Wildlife Service



North American Mussels

- 297 known species in US
- 90 percent live in the Southeast
- 70 percent (208) are listed as threatened, endangered, of special concern, or extinct by state and federal governments



Arkansas Mussels

- 74 species
- Most diverse state West of the Mississippi
- 57 (78%) listed as endangered, threatened, candidate, or of special concern



Buffalo River Mussels

- 26 species known to occur in the Buffalo River
- 15 listed as imperiled or very rare by the Arkansas Natural Heritage Commission
- Some species may be extirpated



Historic Surveys

- Meek and Clark-1912
 - 26 mussel sites
 - 22 species
- Harris-1996
 - 41 mussel sites
 - 26 species



Extirpated Mussels

- Bleufer (*Potamilus purpuratus*)
 - Common
 - Only known fish host freshwater drum
- Black sand shell (*Ligumia recta*)
 - Very rare
 - Fish host: bluegill, largemouth bass, white crappie, and American eel



2004/2005 Objectives

- Examine entire river length for undocumented mussel beds and relocate historic beds
- Document location, surface area, and basic habitat requirements



2004/2005 Objectives

- Perform qualitative and quantitative surveys to estimate biological parameters
- Search for extirpated and endangered species



Methods

- Snorkeling to locate mussel beds
- GPS all sites
- Qualify new beds
- Quantify historic beds





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Qualification Bed

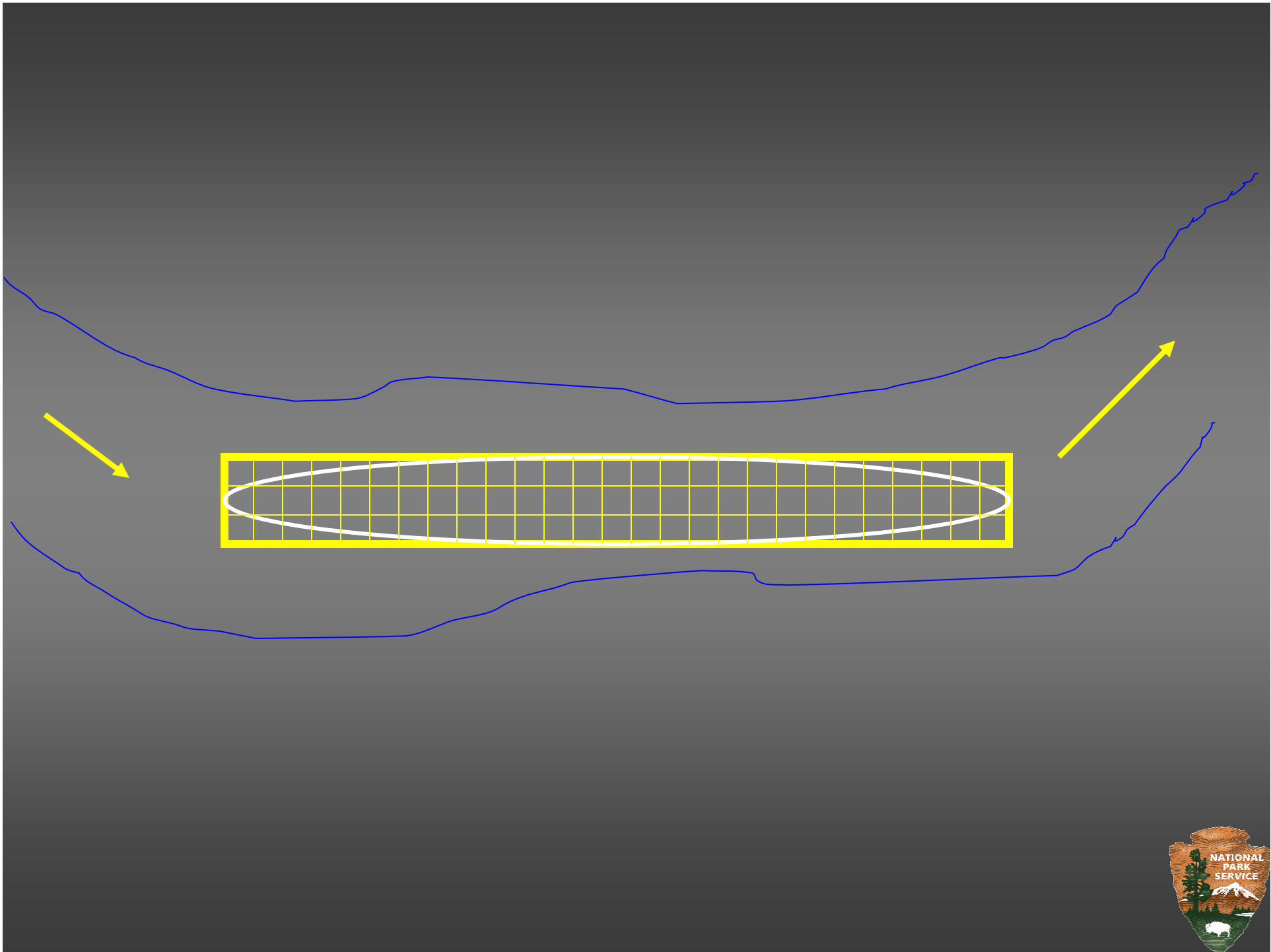
- Timed search for one hour
- Mussels identified to species
- Placed back at location



Quantification

- Delineate mussel bed
- Randomly select one meter quadrates
- No more than 25 quadrates/bed





Quantification

- Mussels placed in mesh dive bag
- Identified to species
- Length, depth and width of shell
- Wet weight



Habitat

- Semi-permanent cross-section
- Pebble counts (bed and habitat)
- Basin-area stream survey
- Other variables: mean and max depth, water width, bankful width, substrate type

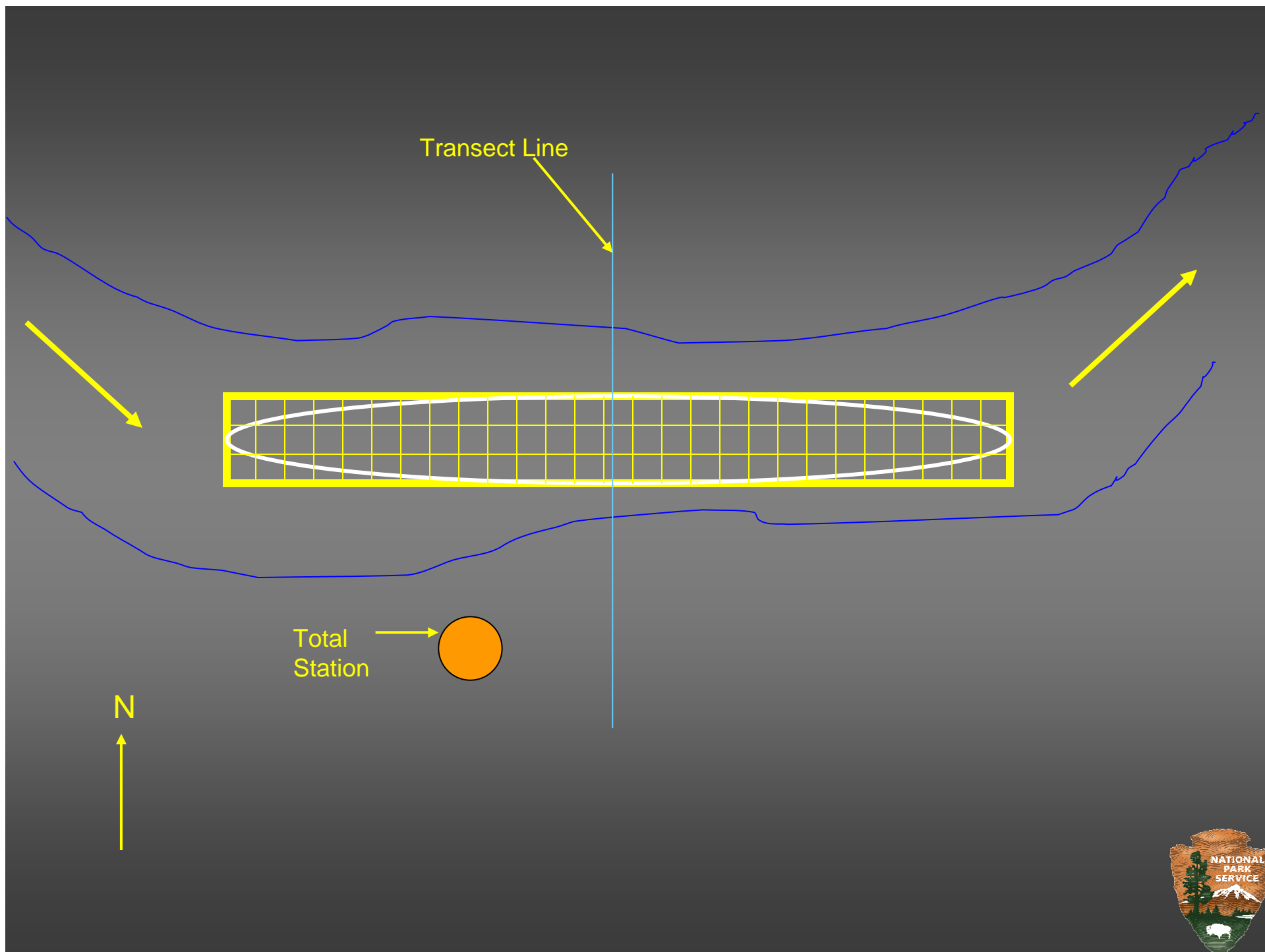




Transect Line

Total
Station

N







Mussel Beds

- Located 43 mussel sites
- 24 classified as beds
- 8 historic
- 16 new





Mussel Species

- 22 native species to date
- 1 introduced (*Corbicula*)
- 35% of river searched



Preliminary Results

- Mussel beds are typically located in flood protected areas
- Spaced 5 to 7 bankful widths





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2006 Objectives

- Select 12 mussel beds for extended monitoring
- Setup permanent monuments for cross-sections
- Full geomorphology of mussel bed reaches



Current Issues

- Dam Construction
- Water Quality
- Flow Regime
- Sedimentation



JAMISON CREEK EROSION SITE

- 10 feet tall and 2100 feet long
- Losing 4 to 24 feet per year (1985 - 1991)
- $2100 \times 10 \times 14 = 294,000$ cubic feet per year
- Or 8,167 dump-truck loads per year

